

**Gravatt, Dan**

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**From:** Gravatt, Dan  
**Sent:** Friday, July 12, 2013 10:32 AM  
**To:** jschu@usgs.gov  
**Subject:** RE: radionuclide samples  
**Attachments:** Westlake split groundwater sample results comparisons.xls

John, both we and the PRPs did Ra, Th and U isotopes in July 2012 and again in April 2013 (and will do them in the two remaining sampling events in 2013). See the attached file for my split comparisons on the July 2012 data. EPA only split filtered samples for metals and rads in July 2012, while the PRPs are doing both filtered and unfiltered (total) samples for metals and rads in all four events.

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Principles and integrity are expensive, but they are among the very few things worth having.

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**From:** Schumacher, John [mailto:[jschu@usgs.gov](mailto:jschu@usgs.gov)]  
**Sent:** Friday, July 12, 2013 8:25 AM  
**To:** Gravatt, Dan  
**Subject:** radionuclide samples

Dan,

In looking at the 2012 data file Paul sent a while back. Here are the radionuclides I see

Ra-226  
Ra-226\_TOT  
Ra-228  
Ra-228\_TOT  
Th-228  
Th-228\_TOT  
Th-230

Are there others you  
all look for in your  
split QA samples?

john

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Analyte, pCi/L	Ra - 226	Ra - 228	Total Ra	U - 234	U - 235/236	U - 238	Total U	Th - 228	Th - 230	Th - 232	Total Th
<b>D-6</b>	2	4.09	<b>6.1</b>	0.16	0 U	0.103	<b>0.3</b>	0.11 U	0.38 U	-0.021 U	<b>0.5</b>
<b>D-6 Duplicate</b>	1.72	3.18	<b>4.9</b>	0.15	0 U	0.1 U	<b>0.3</b>	0.43 U	0.8	0.04 U	<b>1.3</b>
<b>D-6 (PRP)</b>	2.54	3.71 J	<b>6.3</b>	0.25 U	0.03 U	0.05 U	<b>0.3</b>	0.22 UJ	0.24 UJ	0.1 UJ	<b>0.6</b>
<b>PZ-101-SS</b>	16.9	1.78	<b>18.7</b>	1.39	0.021 U	0.52	<b>1.9</b>	0.13 U	0.96	-0.026 U	<b>1.1</b>
<b>PZ-101-SS (PRP)</b>	28.87	3.13	<b>32.0</b>	1.33 J	0.14 UJ	1.35 J	<b>2.8</b>	0.06 U	0.34 J	0.03 U	<b>0.4</b>
<b>S-61</b>	0.51	0.33 U	<b>0.8</b>	0.96	0.048 U	0.84	<b>1.8</b>	-0.02 U	0.48	-0.022 U	<b>0.4</b>
<b>S-61 (PRP)</b>	0.35 J	1.26 J	<b>1.6</b>	1.32	0.22 J	0.86	<b>2.4</b>	-0.03 UJ	0.2 J	0 UJ	<b>0.2</b>
<b>PZ-206-SS</b>	0.6	0.29 U	<b>0.9</b>	0.34	0.023 U	0.105	<b>0.5</b>	0 U	0.53	0.06 U	<b>0.6</b>
<b>PZ-206-SS (PRP)</b>	0.91	1.56 J	<b>2.5</b>	0.27 J	0.04 UJ	0.04 UJ	<b>0.4</b>	0 U	0.1 U	-0.04 U	<b>0.1</b>
<b>MW-102</b>	0.63	0.58	<b>1.2</b>	2.57	0.11	2.38	<b>5.1</b>	0.2 U	1.1	-0.022 U	<b>1.3</b>
<b>MW-102 (PRP)</b>	0.86	0.68 U	<b>1.5</b>	2.14 J	0.12 U	1.85	<b>4.1</b>	0.2 UJ	0.24 UJ	-0.03 UJ	<b>0.4</b>
<b>D-3</b>	1.74	5.16	<b>6.9</b>	0.18	0 U	0.065 U	<b>0.2</b>	0.12 U	0.29 U	0.04 U	<b>0.5</b>
<b>D-3 (PRP)</b>	2.55	5.06 J	<b>7.6</b>	0.08 UJ	0.03 UJ	0.14 UJ	<b>0.3</b>	0.13 U	0.07 U	-0.03 U	<b>0.2</b>
<b>PZ-113-AS</b>	0.48	0.86	<b>1.3</b>	0.58	0.021 U	0.43	<b>1.0</b>	-0.05 U	0.5	-0.023 U	<b>0.4</b>
<b>PZ-113-AS (PRP)</b>	0.73 J	1.24 U	<b>2.0</b>	1.02 J	-0.03 UJ	0.71 J	<b>1.7</b>	0.11 UJ	0.13 J	-0.01 UJ	<b>0.2</b>
<b>PZ-112-AS</b>	1.93	1.96	<b>3.9</b>	0.063	0.026 U	0.005 U	<b>0.1</b>	-0.18 U	0.56	-0.05 U	<b>0.3</b>
<b>PZ-112-AS (PRP)</b>	3.08	2.19	<b>5.3</b>	0.03 UJ	0.04 U	-0.02 U	<b>0.1</b>	0.03 UJ	0.09 UJ	-0.01 UJ	<b>0.1</b>
<b>I-11</b>	0.95	2.49	<b>3.4</b>	0.94	0.1	0.62	<b>1.7</b>	-0.11 U	1.05	0.13 U	<b>1.1</b>
<b>I-11 (PRP)</b>	1.01	2.99	<b>4.0</b>	0.58 J	0.04 U	0.73	<b>1.4</b>	-0.01 U	0.22 J	0.03 U	<b>0.2</b>
<b>PZ-207-AS</b>	0.86	1.58	<b>2.4</b>	-0.005 U	-0.006 U	0.016 U	<b>0.0</b>	0.18 U	0.49	-0.02 U	<b>0.7</b>
<b>PZ-207-AS (PRP)</b>	0.73 J	0.97 U	<b>1.7</b>	0.06 UJ	0.04 UJ	0.08 UJ	<b>0.2</b>	0.05 U	0.11 U	-0.01 U	<b>0.2</b>
<b>D-12</b>	0.66	0.58	<b>1.2</b>	0.15 U	0.009 U	0.12 U	<b>0.3</b>	-0.087 U	0.76	0.05 U	<b>0.7</b>
<b>D-12 (PRP)</b>	0.68	0.51 UJ	<b>1.2</b>	0.12 U	-0.02 U	0.21 J	<b>0.3</b>	-0.01 UJ	0.34 J	-0.01 UJ	<b>0.3</b>
<b>PZ-305-AI</b>	0.6	0.75	<b>1.4</b>	0.09 U	0.06 U	0.14	<b>0.3</b>	0.26 U	0.61	0.09 U	<b>1.0</b>
<b>PZ-305-AI (PRP)</b>	0.7 J	0.27 UJ	<b>1.0</b>	0.07 U	0.2 U	-0.01 U	<b>0.3</b>	-0.01 U	0.76 J	-0.01 U	<b>0.7</b>

Data received from EMSI / PRPs labeled with (PRP).

All results on this table are for FILTERED samples. EPA only split filtered samples, while PRPs did both filtered (dissolved) and unfiltered (total) analyses. The totals for each element simply sum the results of each component isotope, regardless of whether they are U-qualified and/or negative values.